Recognition and Alleviation of Pain in Laboratory Animals

- A.I. Basbaum
- S.J. Bird
- P. Flecknell
- G.F. Gebhart
- L. Goodly
- A. Karras
- S.T. Kelley
- J. Lacher
- G. Mason
- H.L. Shafford
- L.U. Sneddon
- S.G. Soriano

Institute for Laboratory Research
National Research Council
of the National Academies

Contents

1. Pain in research animals – principles and considerations
2. Mechanisms of Pain
3. Recognition and assessment of pain
4. Effective pain management
5. Humane endpoints for animals in pain

Appendix 1 – Models of pain

Appendix 2 – US government regulations and guidelines

Objectives of the Report

- Update information since 1992 report
- Incorporate, where possible, evidence-based knowledge and advice
- Inform IACUC members, investigators, animal care staff and others re:
  - basis of animal pain
  - recognition/evaluation of pain
  - means of reducing and alleviating pain

Findings and Recommendations - 1

- Pain is an aversive state experienced by all mammals and probably all vertebrates
- Pain should be limited to that which is unavoidable
- Pain may be induced deliberately when pain is the subject of study (appendix 1)
- Pain in animals is inferred from behavior
- Pain is a cascade of physiological, cognitive, immunological and behavioral events

Findings and Recommendations - 2

- Pain is difficult to assess and depends on a structured clinical exam and knowledge of normal animal appearance and behavior
- Reliable, broadly applicable pain assessment tools are lacking
- Funding to develop assessment tools is lacking
- Observing animals' response to analgesics can refine clinical assessment
- Anticipating post-procedural pain intensity is central to prevention and/or management

Findings and Recommendations - 3

- Effective pain management is limited by lack of knowledge of drug effects and doses
- Pilot studies can be invaluable to determine earlier and more humane endpoints
- Development and validation of strategies to refine procedures and reduce numbers of animals used should continue - FUNDING

The Report as a Resource

- Painful procedures and conditions
- Ontogeny of pain
- Methods for assessing pain
- Strategies for managing pain
- Guidelines for establishing humane endpoints
- Overview of pain models
- Summary of relevant policies

Humane Endpoints for Animals in Pain

- Earliest indicator of severe pain, severe distress or impending death - what's severe?
- Key is the *reliability* of clinical observations
- Report suggests pilot studies to lessen negative impact, identify endpoint criteria

- As with pain assessment, endpoint criteria should be objective (but are 1° subjective)
  - behavior (observation by experienced persons)
  - body weight

Discussion Questions

What might ICCVAM and NICEATM do to assist with implementing the recommendations relevant to refinement of animal use in testing, such as the guidance on humane endpoints provided in the report?

What might ICCVAM and NICEATM do to assist with implementing the recommendations for pain management guidance as described in the NRC report?

What role might ICCVAM and NICEATM serve in implementing other methods and strategies described in the report?

What suggestions do you have for increasing awareness of this report among organizations and scientists conducting regulatory safety testing?